

-2-

IN THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the Application:

LISTING OF CLAIMS:

1. (Currently amended) An injection molding apparatus, comprising:

a manifold including,

a cast manifold block,

a junction component fixed in the manifold block and having an axial bore with a first end opening to an exterior surface of said manifold block for receiving a flow of melt material, and at least one radial bore in fluid communication with the axial bore and having at least one opening to an outer surface of said junction component, and

at least one pipe fixed in the manifold block, wherein said at least one pipe has a first end that engages said junction component at the at least one opening of said radial bore, said junction component and said at least one pipe defining a manifold channel for directing the flow of melt material; and

a nozzle defining a nozzle channel in fluid communication with the manifold channel for receiving the flow of melt material through said at least one pipe,

~~wherein said junction component and said at least one pipe are fixed within a block that defines said manifold and wherein said junction component and said at least one pipe define a manifold channel for directing the flow of a melt material through said manifold and into said nozzle.~~

2. (Cancelled)

-3-

3. (Original) The apparatus of claim 1, wherein said at least one pipe has at least one bend.

4. (Currently amended) The apparatus of claim 1, wherein ~~the at least one pipe of the manifold~~ further includes:

~~at least one radial pipe having a first end engaging said junction component, and~~

at least one nozzle pipe fixed in the manifold block having a first end engaging a second end of said at least one radial pipe and located intermediate the at least one pipe and the nozzle, said nozzle pipe defining the manifold channel with the at least one pipe and the junction component.

5. (Currently amended) The apparatus of claim 4, wherein one of said first end of said nozzle pipe ~~or and~~ said second end of said radial at least one pipe is telescopically slidable inside the other of said first end of said nozzle pipe and said second end of said at least one pipe, whereby the distance between said junction component and said nozzle is adjustable prior to casting.

6. (Currently amended) The apparatus of claim 1, wherein the manifold further includes:

at least one support pillar component fixed ~~within~~ in said manifold block, said support pillar component defining an axial bore and extending a height of said manifold block; and

a valve pin extending and retracting through said manifold via said axial bore of said support pillar component and into said nozzle channel.

7. (Original) The apparatus of claim 6, wherein said valve pin is connected to an actuation unit disposed outside of said manifold.

8. (Original) The apparatus of claim 6, wherein said support pillar component is coupled to said at least one pipe.

9. (Currently amended) The apparatus of claim 1, wherein said manifold further includes a heating element fixed ~~within~~ in said manifold block.

10. (Original) The manifold of claim 9, wherein said heating element comprises a copper wire.

11. (Original) The apparatus of claim 9, wherein said heating element is a coil surrounding a configuration of at least said junction component engaged with said at least one pipe.

12. (Original) The apparatus of claim 9, wherein said heating element is a coil wrapping at least one full time around said at least one pipe.

13. (Original) The apparatus of claim 9, wherein said manifold further includes a plurality of heating elements.

14. (Currently amended) The apparatus of claim 1, wherein said manifold further includes:

at least one branching junction component fixed in said manifold block and having an axial bore with a first end engaging a second end of said at least one pipe and at least one radial bore in fluid communication with said axial bore with at least one opening to an outer surface of said branching junction component, and

at least one branching pipe, wherein said at least one branching pipe has a first end that engages said at least one opening of said radial bore of the branching junction component.

15. (Currently amended) The apparatus of claim 14, wherein said junction component and said branching junction component support said at least one pipe and said at least one branching pipe before, during and after said manifold block is cast.

16. (Original) The apparatus of claim 1, wherein said at least one pipe is made of stainless steel.

17. (Currently amended) The apparatus of claim 1, wherein said manifold block is made from a soft thermally conductive metal.

18. (Currently amended) The apparatus of claim 17, wherein said manifold block is made from a material selected from the group consisting of copper, copper alloys, bronze, brass, aluminum, aluminum alloys, steel, steel alloys and combinations thereof.

19. (Original) The apparatus of claim 6, wherein said junction component and said support pillar component are made from a tool steel with a high melting point.

20. (Original) The apparatus of claim 19, wherein at least one of said junction component and said support pillar component are made from H13 tool steel.

21. (Original) The apparatus of claim 1, wherein said junction component includes a plurality of radial bores defining a plurality of openings to the outer surface of said junction component and wherein said manifold further includes a plurality of pipes, such that each of said plurality of pipes is fluidly connected to one of said plurality of openings.

22. (Original) The apparatus of claim 1, wherein said first end of said axial bore of said junction component is in fluid communication with a sprue bushing.

23. (Original) The apparatus of claim 1, wherein said junction component is a sprue bushing.

24 - 32 (Cancelled)

33. (New) An injection molding apparatus, comprising:  
a manifold including,

- a manifold block,
- a junction component fixed in the manifold block and having an axial bore with a first end opening to an exterior surface of said manifold block for receiving a flow of melt material, and a radial bore in fluid communication with the axial bore and having an opening to an outer surface of said junction component,

- a radial pipe fixed in the manifold block and having a first end engaging the junction component at the opening of said radial bore, and

- a nozzle pipe fixed in the manifold block and having a first end engaging a second end of said radial pipe, one of said first end of said nozzle pipe and said second end of said radial pipe being telescopically slidable inside the other,

- the junction component, radial pipe and nozzle pipe defining a manifold channel for directing the flow of the melt material through said block; and

- a nozzle defining a nozzle channel in fluid communication with said manifold channel for receiving the flow of melt material.

34. (New) The apparatus of claim 33, wherein said manifold block is a cast block.

35. (New) The apparatus of claim 33, wherein at least one of the pipes has at least one bend.

36. (New) The apparatus of claim 33, wherein said manifold further includes a heating element fixed in said manifold block.

37. (New) The apparatus of claim 33 wherein the manifold further includes a connector disk having a central bore into which a second end of the nozzle pipe is inserted, the connector disk having a first surface that contacts the manifold block and an opposite surface that contacts an end of the nozzle.

38. (New) An injection molding apparatus, comprising:

- a manifold including,

- a manifold block,

- a junction component fixed in the manifold block and having an axial bore with a first end opening to an exterior surface of said manifold block for receiving a flow of melt material, and at least one radial bore in fluid communication with the axial bore and having at least one opening to an outer surface of said junction component,

- at least one pipe fixed in the manifold block, wherein said at least one pipe has a first end that engages said junction component at the at least one opening of said radial bore, the junction component and at least one pipe defining a manifold channel for the flow of melt material, and

- at least one support pillar component coupled to said at least one pipe and fixed in said manifold block, said support pillar component defining an axial bore and extending a height of said manifold block;

- a nozzle defining a nozzle channel in fluid communication with the manifold channel for receiving the flow of melt material, and

- a valve pin retractably extending through said manifold block via said axial bore of said support pillar component and into said nozzle channel.

39. (New) The apparatus of claim 38, wherein said manifold block is a cast block.

40. (New) The apparatus of claim 38, wherein said at least one pipe has at least one bend.

41. (New) The apparatus of claim 38, wherein said valve pin is connected to an actuation unit disposed outside of said manifold.

42. (New) The apparatus of claim 38, wherein said manifold further includes a heating element fixed in said block.